

7.5

Systems of Inequalities in Two Variables

An ordered pair (a, b) of real numbers is a **solution of an inequality** in x and y if the substitution $x = a$ and $y = b$ **satisfies** the inequality.

Ex.

The ordered pair $(2, 5)$ is a solution of $y < 2x + 3$ because

$$5 < 2(2) + 3 = 7.$$

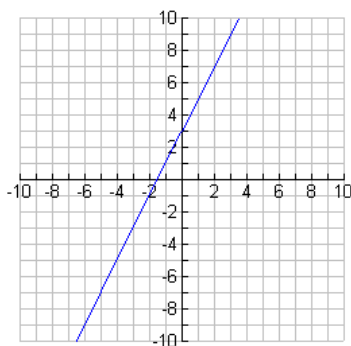
The ordered pair $(2, 8)$ is not a solution because

$$8 < (\text{not}) 2(2) + 3 = 7.$$

When all solutions have been found you have **solved the inequality**.

Graph of an inequality

Draw the graph of the equation $y \geq 2x + 3$. State the boundary of the region.



Check a point in each of the two regions of the plane determined by the graph of the equation. Shade the region that gives a true statement.

All points above the line make the inequality true. The boundary is the line $y=2x+3$.

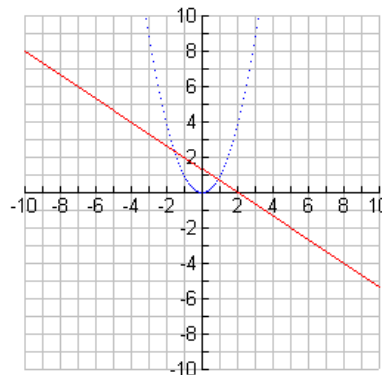
Systems of Inequalities

A solution of a system of inequalities in x and y is an ordered pair (x, y) that satisfies each inequality in the system.

Ex.

Solve the system.

$$\begin{aligned} y &> x^2 \\ 2x + 3y &< 4 \end{aligned}$$



Shade the proper regions for each inequality, the region that is shaded twice is the solution.

Linear Programming

See examples 6, 8 on page 620-622.